Remarks

I. Pending claims

Claims 1-7 pending in the application include a single independent claim 1 and claims 2-7 dependent thereon. Independent claim 1 is directed to a method for treating a condition responsive to interferon-tau (IFNτ) therapy. The key elements of the claimed method are:

(i) orally administering IFNτ to the subject's intestinal tract;

(ii) in an amount effective to produce a measurable increase in the subject's blood 2', 5'-oligoadenylate synthetase (OAS) level, relative to the OAS level in the subject in the absence of interferon-tau administration; and

(iii) continuing to administer interferon-tau to the intestinal tract of the subject in such effective amount, on a regular basis of at least several times per week, for a period of at least one month, independent of further changes in the subject's blood OAS level.

The remaining dependent claims in the application further limit the claimed method as to

(i) the identity of the IFNτ administered (claim 2);

(ii) dosing schedule (claim 3-5);

(iii) IFN-tau responsive condition being treated (claims 3-6)

(iv) a further step of monitoring OAS levels post administration.

None of the dependent claims should be considered independent or distinct from claim 1 since they are all directed to the same subject matter (treating a condition responsive to IFN-tau) and all involve the same basic treatment steps acting through the same mechanism.

II. The Claimed Invention

The claimed method is based on the discoveries that (i) IFNτ is active when delivered to a human subject's intestinal tract, as opposed to the oral cavity, (ii) an effective dose of IFNτ can be based either on a dose that is known to produce an initial rise in blood OAS levels, when administered to the patient's intestinal tract in a patient having a known IFNτ-responsive condition, or alternatively, on a dose that actually

produces such measurable increase in blood OAS, and (iii) continued administration of such an effective dose is therapeutically effective, independent of further changes in blood OAS levels over an extended period of treatment.

A. Advantages and Features of the Invention.

The claimed method provides an improved method for treating a variety of serious medical conditions, including multiple sclerosis, viral infection such as HCV, and cancer, for which either (i) no effective treatment currently exists, (ii) current therapies are associated with serious and sometimes debilitating side effects, and/or (iii) current therapies induce drug resistance which limits the effectiveness of the resistance. In addition, where current therapies require parenteral administration, such as IV administration or drip, additional expense and patient compliance issues can arise.

These limitations are overcome, at least partially, by the present therapeutic method, by the following features of the invention:.

(i) IFNτ is administered in a convenient oral form, such as an enterically coated tablet, that targets the protein to the intestinal tract of the subject;

(ii) the side effects associated with IFNτ administration in humans are generally quite benign, particularly when compared with the relatively debilitating effects of long-term IFNα or IFNβ administration;

(iii) because side effects are minimal, long-term treatment, e.g., for multiple sclerosis is compatible with greatly enhanced quality of life;

(iv) an effective dose of IFNτ can be determined readily by following an initial rise in patient blood OAS levels, independent of whether the patient has a preexisting elevated blood OAS levels, e.g., due to viral infection; alternatively, an effective dose can be predetermined, for a given patient, by a knowledge of an IFNτ dose known to produce such rise in blood OAS in a patient with that particular condition;

(v) continued treatment can be carried out at therapeutic levels of IFNτ corresponding to the initial effective dose, independent of changes in blood OAS levels over the treatment period; and

(vi) the treatment is compatible with concomitant therapies, e.g., anti-viral therapy in the treatment of viral infection or anti-cancer therapy in the treatment of cancers.

B. Patentability Over the Prior Art

The ability to achieve the collective advantages of the claimed method, in accordance with the presently claimed method, (see Section A above) is unsuggested in the prior art for the reasons given below. Our conclusions about the scope and content of the prior art, discussed below, are made on the basis of our review of the references listed in the attached IDS Form 1449. Copies of the references listed in the current Form 1449 that were not previously submitted in a parent application are enclosed herewith.

1. There is no evidence in the prior art that IFNτ is therapeutically active when administered to humans in a form that targets the protein to the intestinal tract.

References identified on the enclosed Form 1449 as Cite No. 10, 12, 14, 17, 18, 19, 21, and 77 (copies enclosed; full citations provided in Appendix 1 attached herewith) all disclose the use of ovine IFNτ for the treatment of a variety of conditions, including autoimmune disorders, such as multiple sclerosis, viral infections, and cancer. Although the references suggest administration of IFNτ by oral administration, among a variety of modes of administration, they do not specifically teach targeting the IFNτ to the intestinal tract of a human subject, rather than oral delivery generally, which could include the oral cavity. Nor do any of the references show that that ovine IFNτ is therapeutically active when targeted to the human intestinal tract.

2. There is no evidence in the prior art that an effective dose of IFNτ can be predetermined or confirmed by following changes in initial blood OAS levels.

None of the effective references show or suggest an increase in human blood levels in response to IFNτ administration, nor is there any evidence to suggest that a non-human IFN would have any effect on such levels. Further, there is no suggestion in the art that an effective dose of IFNτ in humans could be predetermined or confirmed by a measurable increase in initial increase in blood OAS levels.

3. There is no suggestion in the prior art to continue long-term IFNτ administration, based on a dose determined from initial blood OAS response, and independent of changes in blood OAS levels during extended treatment.

Nowhere does the prior art show or suggest that an IFNτ dose determined to be effective based on an initial increase in blood OAS would provide an effective dose over an extended treatment period, independent of changes in actual blood OAS during the treatment period, *e.g.*, in response to a reduction in viral infection or a reduction in tumor load.

4. The claimed method is not inherently taught by the prior art.

To show inherency, it is necessary to show that the prior art in question necessarily produced the newly claimed effects, and that a person skilled in the art would recognized that the newly claimed effects were necessarily achieved. (*Continental Can Co. USA, Inc. v. Monsanto Co,* 948 F. 2d. 1264, 20 USPQ2d 1746 (Fed. Cir. 1991). Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. (*In re Robertson,* 169 F. 3d 743, 49 USPQ2d 1949 (Fed Cir. 1999, quoting from *In re Oelrich*, 666 F.2d 578, 212 USPQ 323 (CCPA, 1981).

Although the prior art discloses a range of IFNτ in treatment, there is no evidence in the prior art to suggest that any specifically disclosed IFNτ dose, or that every IFNτ dose within a specified range in the prior art, would produce a measurable increase in human blood OAS levels, when administered to the intestinal tract of any specific patient for the treatment of a particular condition. Unless blood OAS levels are actually measured following IFNτ dosing, or unless oral IFNτ doses are predetermined from patients with known conditions, actual OAS blood level response to any given dose of IFNτ, with respect to a given condition, and when administered to the patient's intestinal tract, would be a matter of conjecture, and thus not an inherent property.

Further, it cannot be argued that a person skilled in the art would know how to select an effective IFNτ dose, in accordance with the claim, because one skilled in the art would not be aware of the target goal (elevated blood OAS).

Since the prior art does not teach or suggest all of the steps in the claimed invention, nor provide an inherent teaching of all of these steps, nor achieve all of the advantages of the invention noted above, the prior art cannot be said to anticipate or render the claimed invention obvious. Therefore, an Notice of Allowance of the claims is earnestly solicited.

Respectfully submitted,

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